

# (12) UK Patent Application (19) GB (11) 2 352 872 (13) A

(43) Date of A Publication 07.02.2001

(21) Application No 9917965.7

(22) Date of Filing 02.08.1999

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(51) INT CL<sup>7</sup>

H01L 23/36 , H05K 7/20

(52) UK CL (Edition S )

H1K KPDC K1CA K5D2

(56) Documents Cited

EP 0729183 A2 EP 0602298 A1 EP 0055578 A2  
US 5467251 A

(58) Field of Search

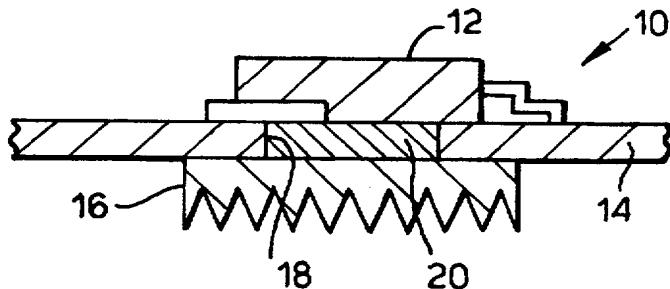
UK CL (Edition Q ) H1K KPDC KPDX , H1R RBK  
INT CL<sup>6</sup> H01L , H05K 7/20  
ON LINE,W.P.I.,EPODOC,JAPIO

(54) Abstract Title

**Cooling a component mounted on a PCB**

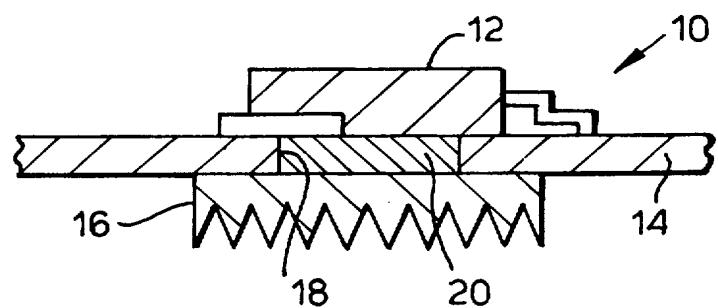
(57) An arrangement 10 for mounting an electronic component 12 on a printed circuit board 14 comprises forming an aperture 18 in the printed circuit board; filling the aperture with a heat conducting, electrically insulating, medium 20; mounting the component on one side of the printed circuit board adjacent the aperture; and mounting a heat sink 16 on the opposite side of the printed circuit board to the component adjacent the aperture. The arrangement provides improved heat transfer from the component to the heat sink.

Fig.1.



GB 2 352 872 A

Fig.1.



COMPONENT MOUNTING ON PCB

Technical Field

5 The present invention relates to an arrangement for mounting an electronic component on a printed circuit board (PCB).

Background of the Invention

10 It is known to mounted an electronic component on one side of a PCB, and a heat sink on the opposite side of the PCB adjacent the component in order to provide a means of heat conduction away from the component. However, the PCB can hinder heat transfer from the component to the heat sink.

Summary of the Invention

15 It is an object of the present invention to overcome the above mentioned problem.

An arrangement in accordance with the present invention for mounting an electronic component on a printed circuit board comprises forming an aperture in the printed circuit board; filling the aperture with a 20 heat conducting, electrically insulating, medium; mounting the component on one side of the printed circuit board adjacent the aperture; and mounting a heat sink on the opposite side of the printed circuit board to the component adjacent the aperture.

25 The present invention provides improved heat transfer from the component to the heat sink.

Brief Description of the Drawings

The present invention will now be described, by way of example, with reference to the accompanying drawings, in which:-

30 Figure 1 is a cross-sectional view of an arrangement for mounting a component on a PCB in accordance with the present invention.

Description of the Preferred Embodiment

Referring to the drawing, the arrangement 10 for mounting a component 12, for example, a MOSFET, on a printed circuit board (PCB) 14 5 includes placing a heat sink 16 on the opposite side of the PCB to the component. An aperture 18 is formed in the PCB 14 between the component 12 and the heat sink 16. A thermally conductive gel 20, or other heat conductive, electrically insulating, medium is placed in the aperture 18.

This arrangement 10 provides an improved heat conductive path 10 from the component 12 to the heat sink 16 to provide improved heat transfer from the component to the heat sink. Such an arrangement 10 allows for a reduction in the size of the heat sink compared to previously known arrangements.

Claims

1. An arrangement for mounting an electronic component on a printed circuit board comprising forming an aperture in the printed circuit board; filling the aperture with a heat conducting, electrically insulating, medium; mounting the component on one side of the printed circuit board adjacent the aperture; and mounting a heat sink on the opposite side of the printed circuit board to the component adjacent the aperture.  
5
2. An arrangement as claimed in Claim 1; wherein the heat conducting medium is a gel.
3. An arrangement as claimed in Claim 1 or Claim 2, wherein the component is a MOSFET.
4. An arrangement substantially as herein described with reference to, and as shown in, the accompanying drawings.



INVESTOR IN PEOPLE

COLIN STONE  
10 November 1999

Application No: GB 9917965.7  
Claims searched: All

Examiner:  
Date of search:

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): H1R(RBK);H1K(KPDC,KPDX)

Int Cl (Ed.6): H01L,H05K 7/20

Other: ON LINE,W.P.I.,EPODOC,JAPIO

**Documents considered to be relevant:**

Category	Identity of document and relevant passage		Relevant to claims
X	EP 0729183 A2	A.T.&T. (See Fig.6)	1,2
X	EP 0602298 A1	S.G.S.-THOMSON	1
X	EP 0055578 A2	HONEYWELL	1
X	US 5467251	NORTHERN TELECOM	1

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

**DERWENT-ACC-NO:** 2001-149939

**DERWENT-WEEK:** 200116

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**TITLE:** Cooling a component mounted on a printed circuit board using a heat conducting electrically insulating medium filling an aperture made in the circuit board

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**PATENT-ASSIGNEE:** DELPHI TECHNOLOGIES INC [DELPN]

**PRIORITY-DATA:** 1999GB-017965 (August 2, 1999)

**PATENT-FAMILY:**

<b>PUB-NO</b>	<b>PUB-DATE</b>	<b>LANGUAGE</b>
GB 2352872 A	February 7, 2001	EN

**APPLICATION-DATA:**

<b>PUB-NO</b>	<b>APPL-DESCRIPTOR</b>	<b>APPL-NO</b>	<b>APPL-DATE</b>
GB 2352872A	N/A	1999GB-017965	August 2, 1999

**INT-CL-CURRENT:**

<b>TYPE</b>	<b>IPC</b>	<b>DATE</b>
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CIPS	H01L23/367	20060101
CIPS	H01L23/373	20060101
CIPS	H05K1/02	20060101
CIPS	H05K7/20	20060101

**ABSTRACTED-PUB-NO:** GB 2352872 A

**BASIC-ABSTRACT:**

NOVELTY - The arrangement (10) for mounting a metal-oxide-silicon field-effect transistor (12) on a printed circuit board (PCB) (14) includes a heat sink (16) on the opposite side of the board to the transistor and an aperture (18) is formed in the board between the transistor and the heat sink. A thermally conductive electrically insulating gel is placed in the aperture to provide an improved heat conductance path from the transistor to the heat sink and to provide improved heat transfer.

USE - Cooling a component mounted on a PCB.

ADVANTAGE - Reduced size of heat sink.

DESCRIPTION OF DRAWING(S) - The drawing is a cross-sectional view of the mounting arrangement

Mounting arrangement (10)

Transistor (12)

PCB (14)

Heat sink (16)

Aperture (18)

**CHOSEN-DRAWING:** Dwg.1/1

**TITLE-TERMS:** COOLING COMPONENT MOUNT PRINT  
CIRCUIT BOARD HEAT CONDUCTING  
ELECTRIC INSULATE MEDIUM FILL  
APERTURE MADE

**DERWENT-CLASS:** U11 V04

**EPI-CODES:** U11-D02B1; V04-Q02A; V04-T03;

**SECONDARY-ACC-NO:**

**Non-CPI Secondary Accession Numbers:** 2001-110121